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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,062	08/18/2003	John R. Richards	4094-009	4152
24112	7590	06/16/2005	EXAMINER	
COATS & BENNETT, PLLC			WONG, EDNA	
P O BOX 5			ART UNIT	
RALEIGH, NC 27602			PAPER NUMBER	
			1753	
DATE MAILED: 06/16/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/643,062

Applicant(s)

RICHARDS ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 12, 13 and 15-18 is/are allowed.
6) ☒ Claim(s) 1-4, 6-11 and 14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This is in response to the Amendment dated May 23, 2005. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Specification

The disclosure has been objected to because of minor informalities.

The objection of the disclosure has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 112

Claims **1-11, 13-14 and 16-18** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 1-11, 13-14 and 16-18 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

Claims **1-11** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Stevens** (US Patent No. 4,416,748).

With respect to claim 5, the rejection under 35 U.S.C. 103(a) as being

unpatentable over Stevens has been withdrawn in view of Applicants' amendment.

Claim 5 has been cancelled.

With respect to claims 1-4 and 6-11, the rejection under 35 U.S.C. 103(a) as being unpatentable over Stevens, the rejection is as applied in the Office Action dated January 26, 2005 and incorporated herein. The rejection has been maintained for the following reasons:

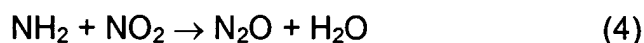
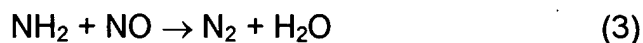
Applicants state that Applicants' invention is directed at removing ammonia while Stevens teaches injecting ammonia, and furthermore, in order to remove ammonia from the gas stream Applicants' invention focuses on maintaining NO_x in the gas stream to assist in the removal of ammonia while Stevens teaches injecting ammonia into the gas stream in order to remove the NO_x. Stevens teaches away from Applicants' invention.

In response, although Stevens injects ammonia into the gas stream, the ammonia is removed from the gas stream according to the equation:



(col. 1, line 15).

Stevens teaches that the concentrations of SO₂ and/or NO_x increase (col. 5, 65-66). This would have maintained a NO_x concentration in the gas stream. The NO_x concentration (which is recited broadly in Claim 1) would have been at a concentration level sufficient to maintain in the gas stream an active set of free radical chain reactions according to the equations:



(col. 1, lines 22-24).

The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

Applicants state that Applicants' process is not obvious based on Stevens because the Applicants' claimed invention (1) does not involve the irradiation of ammonia in the spectral range of 190 to 220 nanometers and (2) does not result in the formation of high concentrations of hydrazine.

In response, Claim 1 as presently written is open to the spectral range of 190 to 220 nanometers and to the formation of high concentrations of hydrazine. The word "comprising" is inclusive and fails to exclude unrecited steps. *In re Horvitz* 168 F 2d 522, 78 USPQ 79 (CCPA 1948).

Applicants state that Stevens does not teach maintaining the ratio of NO_2/NO to a value of less than 10.

In response, Stevens teaches $\text{N}_2 + \text{O}_2 \rightarrow 2\text{NO}$ and $2\text{NO} + \text{O}_2 \rightarrow 2\text{NO}_2$ (col. 5, lines 19-35). Stevens' method inherently has a ratio of NO_2/NO .

Maintaining this ratio is a result-effective variable and one skilled in the art has the skill to calculate the ratio that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b). Stevens teaches that the percentage reduction of NO_x that will be required in any given case will of course depend on the initial concentration of NO_x in the flue gas and the levels of NO_x concentration that it is desired to achieve in stack gas passed to the atmosphere (col. 7, lines 20-26).

Furthermore, changes in concentration is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Boesch*. 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and MPEP § 2144.05(b).

Response to Amendment

Claim Rejections - 35 USC § 112

Claims **1-4, 6-11 and 14** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

line 4, it appears that the "irradiating" step recited in claim 1, line 2, forms the free radicals that remove a hydrogen atom from the ammonia to form NH_2 . However, it is unclear if it is. If it is not, then how are the free radicals formed?

Claim 3

lines 1-2, "the set of free radicals formed" lacks antecedent basis.

line 2, it appears that the "ammonia" is the same as that recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word "with".

Claim 6

line 3, it appears that the "ammonia" is the same as that recited in claim 1, line 1. However, it is unclear if it is. If it is not, then what is the different between this ammonia and the ammonia recited in claim 1, line 1 in the same gas stream?

Claim 7

lines 2-3, it appears that the "free radicals" is the same as that recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word "with".

line 3, it appears that the "ammonia" is the same as that recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word "with".

Claim 10

lines 1-2, "the dissociated hydrogen atoms" lack antecedent basis.

Claim 11

line 1, "the dissociated atoms" lack antecedent basis.

Claim 14

line 3, it appears that the "irradiation" is the same as that recited in claim 12, line 10. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word "to".

line 3, it appears that the "ammonia" is the same as that recited in claim 1, line 1.

However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word "with".

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

Claims **12-18** define over the prior art of record because the prior art does not teach or suggest a method of producing cement and removing ammonia from a gas stream produced, comprising the steps of (a) directing, (b) directing, (c) heating, and (d) irradiating as presently claimed, esp., the steps of (a) directing a raw feed into a pyroprocessing system of a cement manufacturing facility, and heating the raw feed as the raw feed moves through the pyroprocessing system, (b) directing the heated raw feed through at least one kiln that forms a part of the pyroprocessing system to produce cement clinker, and (c) heating the pyroprocessing system and directing the resulting gas stream through the pyroprocessing system.

The prior art does not contain any language that teaches or suggests the above. *Stevens* does not teach the steps of (a) directing a raw feed into a pyroprocessing system of a cement manufacturing facility, and heating the raw feed as the raw feed moves through the pyroprocessing system, (b) directing the heated raw feed through at least one kiln that forms a part of the pyroprocessing system to produce cement clinker, and (c) heating the pyroprocessing system and directing the resulting gas stream

through the pyroprocessing system. Therefore, a person skilled in the art would not have been motivated to adopt the above conditions, and a prima facie case of obviousness cannot be established.

Claim 14 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

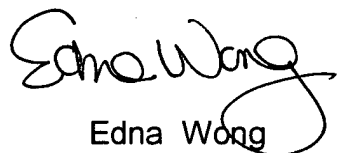
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-

1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Edna Wong
Primary Examiner
Art Unit 1753

EW
June 13, 2005